

# WETVAULT SIZING WORKSHEET

## 2005 Surface Water Design Manual Sizing Method

Project name: \_\_\_\_\_

### METHODS OF ANALYSIS

#### Step 1) Determine volume factor $f$ .

Basic size  $f =$  3 Consult WQ requirements(Section1.2.8)

#### Step 2) Determine rainfall $R$ for mean annual storm.

Rainfall ( $R$ ) \_\_\_\_\_ (feet) Required from Figure 6.4.1.A

#### Step 3) Calculate runoff from mean annual storm

$$V_r = (0.9A_i + 0.25A_{ig} + 0.10A_{tf} + 0.01 A_{og}) \times R$$

$A_i =$	tributary area of impervious surface	_____ (sf)	Determine now
$A_{ig} =$	tributary area of till grass	_____ (sf)	Determine now
$A_{tf} =$	tributary area of till forest	_____ (sf)	Determine now
$A_{og} =$	tributary area of outwash grass	_____ (sf)	Determine now
$R =$	rainfall from mean annual storm	_____ (ft)	From Step 2
$V_r =$	volume of runoff from		
	mean annual storm	_____ (cf)	

#### Step 4) Calculate wetpool volume

$$V_b = f V_r$$

$f =$	Volume factor	<u>3</u> (unitless)	From Step 1
$V_r =$	volume of runoff, mean annual storm	_____ (cf)	From Step 3
$V_b =$	Volume of the wetpool	_____ (cf)	

#### Step 5) Determine wetpool dimensions

##### a) Determine geometry of first cell

Volume in first cell	_____ (cf)	Must be 25 - 35%
Depth $h$ 1st cell (minus sed. stor.)	_____ (ft)	See Section 6.4.1.2
Determine horizontal xs-area at surface		
$A_{top} =$	_____ (sf)	If square = take sqrt
Find top dimensions by adjusting for shape geometrics		
Dimension of 1st cell: width	_____ (ft)	
length	_____ (ft)	

##### b) Determine geometry of second cell

Volume in second cell	_____ (cf)	Must be 65 - 75%
Depth $h$ of 2nd cell	_____ (ft)	See Section 6.4.1.2
Determine xs-area at surface		
$A_{top} =$	_____ (sf)	
Dimension of 2nd cell: width	_____	

Dimension of 2nd cell: length \_\_\_\_\_ (ft) If rectangular, short side =  
24 ft to match cell 1

Geometry check: overall pond L : W at mid depth = 3 : 1

Cell 1 length (mid-depth) \_\_\_\_\_ (ft)  
Cell 2 length (mid-depth) \_\_\_\_\_ (ft)  
Vault length = cell 1 + 2 \_\_\_\_\_ (ft)  
Vault width \_\_\_\_\_ (ft)  
Lmid : Wmid = \_\_\_\_\_

**Step 6) Design rest of vault (Section 6.4.2.1)**

Internal baffle

Inlet & Outlet

Access

Effective area \_\_\_\_\_ (3.2.2.1)

Note 5'X10" access, grating and corner vent holes

Other Design Details (Sections 6.2.2, 6.2.3, and 6.2.4)

Sequence of Facilities

Setbacks

Sideslopes, fencing, embankment

**SIZE SUMMARY: Surface area, change in elevation**

Vault width \_\_\_\_\_ (ft)  
Vault length \_\_\_\_\_ (ft)  
Surface area \_\_\_\_\_ (sf)  
Elevation change needed: \_\_\_\_\_ (ft)